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ABSTRACT

This guide is designed to give persons working with developmentally disabled clients a practical introduction to the strengths and weaknesses of electronic message systems. It supplies answers to questions often asked by human services personnel, and includes brief descriptions of message systems now available or anticipated in the near future. The advantages and disadvantages of basic types of electronic message systems are briefly discussed, as well as ways in which a group can determine whether it is a good candidate for such a service, what an organization needs to get started, and how to operate an electronic message system. An explanation of the costs of electronic mail systems, a list of human service organizations using such systems, and a list of 11 service providers are also included. Information on a project at New York University and a list of papers on telecommunications in human services available from the project are appended. (MER)

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CHOOSING AN ELECTRONIC MESSAGE SYSTEM:
A GUIDE FOR THE HUMAN SERVICES

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CHOOSING AN ELECTRONIC MESSAGE SYSTEM: A GUIDE FOR THE HUMAN SERVICES

INTRODUCTION

The exchange of text messages is as old as written language. At least two key aspects of electronic message systems are new: the speed of communication and the number of people who can be easily involved in the message exchange. Messages are typically typed on a standard computer terminal and transmitted for others to see.

The uses of such systems are varied and potentially significant for many human services groups. Their cost is declining; there are even a few situations in which the cost of such systems is already competitive with the conventional postal service. But it can be rather bewildering for novice groups to try out and begin using electronic message systems.

This paper is designed for persons at University Affiliated Programs, members of consumer organizations, and others working with developmentally disabled people. Our goal is to provide a practical introduction to the strengths and weaknesses of electronic message systems. Specifically, this paper provides answers to questions typically asked by human services personnel and brief descriptions of message systems available now or in the near future. While, in the interest of brevity, many specifics are not included here, the human services reader with no previous knowledge about electronic message systems should find this a good beginning point.

Electronic message systems are indeed promising, but they are also in their formative years. "Formative" to potential users of such systems often means risky. This paper is intended to help human services professionals realistically evaluate the risks and promises.

WHAT ARE THE BASIC TYPES OF ELECTRONIC MESSAGE SYSTEMS?

The current designations for electronic message systems--electronic mail, computer mail, or computer conferencing--can be misleading. They use an old nomenclature to label a new class of communications services. Electronic message systems have the capacity to function quite differently from today's approaches to mail and conferencing. The term "electronic message system" is used here as an umbrella term describing all forms of interpersonal communication through electronic media. These systems can be divided into two distinct groups: electronic mail and computer conferencing.

- **Electronic mail** or computer mail usually means person-to-person communication, although it is sometimes used as an electronic bulletin board. An electronic analogue to the postal service, computer mail refers to sending messages via computer linkage from one individual to one or more others. Electronic mail is also sometimes used to describe Telex and telecopiers, more commonly called facsimile systems, which send copies electronically among two or more sites.
- **Computer conferencing** (alternately called computerized conferencing, computer-based conferencing, or computer-mediated interaction) is group communication through a computer, where the system facilitates group communication. A major distinction between computer conferencing and most other forms of group communication is that participants in a computer conference need not be present simultaneously.

Basic electronic mail and computer conferencing operations are very similar, and some systems do in fact perform both functions. Unfortunately, these multifunctional systems often handle only one function gracefully. The other function is thus available, but only if the user is willing to put up with the difficulties involved in its use. For example, most electronic mail systems allow messages to be addressed to groups or individuals, but rarely do they store a group conference transcript in a form that is easy to review. Conversely, many computer conferencing systems do not have convenient personal storage files for private messages, which are not part of a group discussion.

WHAT ARE SOME ADVANTAGES OF USING AN ELECTRONIC MESSAGE SYSTEM?

A recent survey* of managers, professionals, and secretaries who had experience with electronic message systems showed a number of favorable perceptions on the part of users:

- increased long-distance communication
- decreased time on the phone
- increased productivity
- increased liking for their jobs

The perceived benefits of electronic message systems varied considerably with the type of job a person had. But overall, electronic message systems had a favorable rating.

WHAT ARE SOME DISADVANTAGES OF ELECTRONIC MESSAGE SYSTEMS?

Electronic message systems are still relatively new. The growth in the number of operational systems and the resultant diversity in standards are typical problems of new technologies. Users of one system are unable to communicate with users on another system.

Another disadvantage of electronic message systems is that a sloppy introduction of such a system can frustrate a fair trial. It may be doomed before it gets under way. A new system cannot be successfully introduced without careful regard for users and their needs.

*Raymond R. Panko, "The EMS Revolution," Computerworld, August 25, 1980, pp. 45-56. This is only one of a number of evaluations of electronic message systems. See also Starr Roxanne Hiltz and Murray Turoff, The Network Nation: Human Communication via Computer (Reading, MA: Addison-Wesley), 1978 and Robert Johansen, Jacques Vallee, and Kathleen Spangler, Electronic Meetings: Technical Alternatives and Social Choices (Reading, MA: Addison-Wesley), 1979.

HOW DO I KNOW IF MY GROUP IS A GOOD CANDIDATE FOR AN ELECTRONIC MESSAGE SYSTEM?

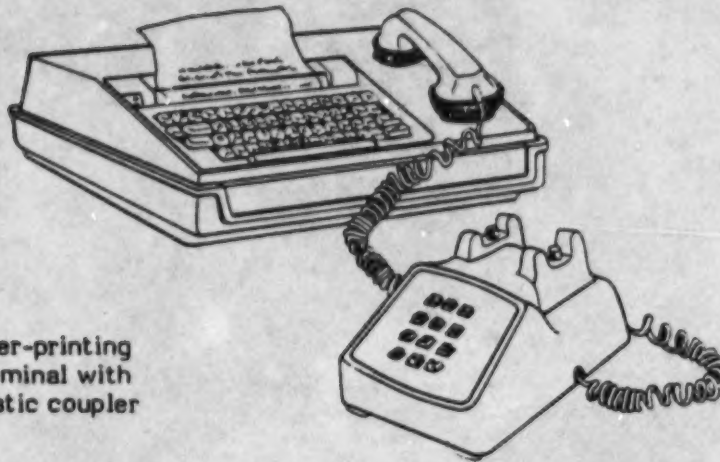
A promising candidate group ought to have at least a few of the following characteristics:

- geographical separation, perhaps across time zones
- busy people
- high perceived need to communicate with each other
- willingness to try something a bit different
- easy access to a computer terminal (or willingness to purchase one)
- substantive focus on topics that can be expressed well in writing
- a leader (formal or informal) who can organize the new communication activity

Electronic message systems are particularly well suited to use by persons or groups that have a need for rapid exchange of information among geographically separated locations. That information exchange might assume the form of discussing common problems, sharing resources, collaborating on a document, or keeping abreast of what is going on back at the office while you are traveling. Central offices can also use electronic message systems for maintaining regular communications with their field offices or member organizations.

WHAT DO I NEED TO GET STARTED?

The start-up process may be easier and less costly than you think. In addition to some of the group characteristics just mentioned, you will need access to a "system," which is made up of equipment (hardware) and computer programs and procedures (software). The equipment needed includes a normal telephone, a standard computer terminal, and an acoustic coupler or modem (often built into the terminal). Once you have this equipment, you can choose the software from a number of system providers such as those listed at the end of this paper.



Standard paper-printing
computer terminal with
built-in acoustic coupler

Be careful of trying to develop your own message system on a nearby computer. The basic problems associated with designing your own system are: (1) The design of the system itself is much more difficult than it looks. The way the system looks to the user is most important, and an effective design typically takes months to develop and test. (2) Existing computers are probably not set up for providing communications-oriented services. Electronic message systems can become a serious drain on other computer functions such as retrieving and processing of data. Conversely, if the message system is not given a high priority within the computer, the users will perceive it as sluggish and nonresponsive. There will be people who will tell you that it is easy to design your own message system and run it on an existing computer. We have heard this often, but rarely seen it work.

HOW DO I ACTUALLY USE AN ELECTRONIC MESSAGE SYSTEM?

Once you have a computer terminal and a telephone, you dial the phone number of the nearest access point to the network or computer your message system uses. You hear a high-pitched tone, indicating that the computer is alive and well, and you place the telephone in the coupler on the terminal. The computer asks you to jump through a few verbal hurdles regarding accounts and passwords. Once you have satisfied the computer that you are a participant, you are offered any new messages that have arrived since you last checked. In a computer conferencing system, you may have a variety of topic-oriented conferences to check, and you may want to enter new information.

The sample transcript from a computer conferencing system shows the user's responses (in bold) to one computer conferencing system's questions during the log-in procedure. The user selects an activity, checks in to find that no new messages have been left, and leaves a message directed to one participant but intended for the whole group to see. Note that this is a self-activated medium: you use it when you want to use it--assuming the computer is available when you are. This characteristic means that participants must have some agreed-upon schedule for checking the system; otherwise, important messages may go unseen, and the sender will become increasingly frustrated with the negligent intended receiver.

SAMPLE TRANSCRIPT FROM A COMPUTER CONFERENCING SYSTEM

Welcome.

Please type your last name (and then strike the CR key).

- SMITH

Please type your password.

- BACON

Thank you.

You may attend any one of the following activities:

1. Northern Network
2. I-Team Pilot
3. Evaluation Demonstration

Please type the number of the activity you wish to join.

3

27-Aug-80

The title of the activity is:

Evaluation Demonstration

You are up to date.

(31) Smith

- Kathryn, your comments on the last version of the questionnaire helped a lot. I'd like
- input from the whole group as to how appropriate the level of detail in section 6 is.

- CTL C

Your current participation is ended.

Thank you.

Terminal time 0:03:53

DO I HAVE TO KNOW ANYTHING ABOUT COMPUTERS?

Ideally, no. Most systems assume no computer expertise on the part of the users. There are, however, widely differing notions of what constitutes an easy-to-use system. Virtually all system developers will say their systems are simple to use. The problem is to get a reading on what they mean by "simple." We suggest trying out a system yourself before accepting the sales brochure's promise of simplicity. In general, you can safely assume that no specialized computer knowledge is necessary. Probably the worst you will have to endure is some system designers' obtuse jargon.

DO I HAVE TO KNOW HOW TO TYPE?

Probably not, although rapid typing is an advantage. Previous users have been surprisingly adaptable, even if they are hunt-and-peck typists. Yet some participants may not be willing to type, even if they are able. For example, some executives or managers may see typing as beneath them. (Conversely, use of a computer terminal might be a status symbol in some organizations.) Another factor to consider is that most systems charge for the length of time a user is connected to the system reading and sending messages. Thus, slow typists will pay more.

Some users have had a secretary or a single participant type in entries for all the participants. Such an approach can work reasonably well, although it can also introduce more formality than desired. For example, direct participants may be typing in offhand reactions and comments while a participant with a secretary is dictating formal "memos." Also, people who do not interact with the system themselves may tend to feel less involved.

ARE THERE ANY AIDS FOR HANDICAPPED PEOPLE?

Computer terminals are often awkward for people without handicaps to use. It is important to exert care in selecting a terminal to be used by nontechnical people. Ease-of-use problems are compounded if those people have physical handicaps. Adaptive devices are currently available that will allow blind and manually handicapped people to use electronic message systems. For example, partially sighted people can use large

print terminals; blind people can use Braille systems that interface with computers; and people who have limited or no use of their hands can type using devices they manipulate with their mouths.

In fact, computer conferencing and electronic mail can be an advantage for people with physical handicaps: well-designed adaptive devices can put them on an equal footing with other people in exchanges where, face to face, they might have been disadvantaged or discriminated against. Computer conferencing also eliminates travel problems, which can be a significant communication barrier to handicapped people.

WHAT ARE SOME TYPICAL USAGE STYLES?

For electronic mail, the key variations in usage style are variations in structure and formality. A general-purpose electronic mail system can be very structured, with a regular schedule of pickup and delivery. Within the boundaries of the system, anyone can be addressed, and it is assumed that the message will be delivered within an agreed-upon time. In such an arrangement, a central person at each site would probably take responsibility for message pickup and delivery. In less formal systems, agreements may be more ad hoc and the groups less clearly defined.

The range of styles varies more in computer conferencing. A "seminar-style" meeting is perhaps most common, with defined participants, a topic focus, and often a stated duration. "Notepad-style" conferences are less formal and may extend indefinitely with a changing cast of participants. Computer conferences can be enhanced by introducing computer aids such as online questionnaires or a structure for browsing through topics and choosing ones to explore in depth.

A basic distinction between computer conferencing and other forms of group "meetings" involves whether or not the participants are present simultaneously. Some systems (e.g., EIES, "Chat" on The Source) allow for simultaneous communication, often referred to as synchronous conferencing. Most current uses, however, are asynchronous--that is, the participants may not all be present at the same time. Asynchronous communication offers busy people flexibility in scheduling, which is both attractive and dangerous. Too flexible an approach to a conference can defeat its purpose if that purpose is timely information exchange.

WHAT ARE THESE SYSTEMS LIKELY TO COST?

Actual cost figures for electronic messaging are difficult to pin down. Because of the variations among systems and differential costing structures, ballpark figures that cover any "typical" system configuration are impossible. As a general guide, keep in mind the various cost components of these systems. These components refer to typical charges for access and use that are common to all systems.

Equipment costs

Equipment includes a computer terminal and an acoustic coupler. The coupler is often a built-in feature of portable terminals. Terminal prices vary considerably, from around \$600 to \$2,000 and up. A good portable terminal with coupler costs about \$1,500 (mid-1980), with costs decreasing. Acoustic couplers range in price from \$150 to \$400 or more. Equipment may be purchased outright or leased on a monthly basis.

Transmission costs

These costs include the charges for your telephone call to the nearest computer time-sharing access port, as well as a specified rate for connection to the "host" computer, the computer on which the message system actually resides. The former generally involves only the cost of a local phone call in most major metropolitan areas in the U.S. Computer connection rates are higher for more remote areas, which have fewer and more expensive telephone lines. Time-sharing networks also provide special WATS lines (800 numbers), but usage rates for these lines are considerably higher than rates for regular phone calls. Each user pays for his or her own telephone charges. Computer connection rates are sometimes \$20 or more an hour, but there is a wide variation here.

Computer utilization

This cost component involves actual use of the computer program or software package (e.g., reading and sending messages, accessing and making conference entries). These charges vary considerably among systems. At present, conferencing systems typically charge for specific amounts of computer resource units; electronic mail systems usually charge based upon the number of messages sent. All systems charge fixed amounts for input and storage, although the rate varies.

Administrative overhead

Providers of these services generally charge a fixed amount for setting up an account. This may be a one-time charge or a fixed monthly rate for all users on a single account. You can also expect to be assessed for special services such as providing you with a record of usage levels of individual participants on your account.

The variability of costs across electronic message systems can get even stickier. Even a straightforward rating structure for a specific component--for example, connection time charges--may be misleading. The amount of time a user consumes is affected by his or her typing speed and by the length of the entry being put into the system. Of course there are ways to reduce this cost, such as composing lengthy messages offline.

A general rule of thumb is to get as much information as possible from the service provider on rates for each of the cost components. Then you can make a general estimate of how much you will actually have to pay based upon: (1) quantity and type of equipment that must be purchased or leased; (2) availability of network access ports to users on your account; and (3) proposed level of use (e.g., how many hours of connect time or number of messages sent) for each location on your account.

WHAT MIGHT GO WRONG?

Lots of things. First of all, electronic message systems have sometimes been used to connect people who do not really need (or want) to be connected, even though they may have been reluctant to admit it. The result is nonuse.

These systems are probably even more dependent upon a good leader than face-to-face groups. Someone has to play the role of facilitator, especially at the start. This person (or it may be a small group) will function best if he or she is knowledgeable about the inner workings of the organization in which the system is being introduced. The role is also that of advocate for the change process necessary for the message system to become a regular part of daily activities. If the leadership is not very carefully coordinated, the use of any electronic message system becomes difficult.

In the beginning, topical focus is particularly important to develop momentum. But in grasping for focus, early users should not seek too much structure too soon. Try out the medium for a while before jumping to a highly structured format.

The computers themselves can also cause problems, for example, by being unavailable or slowed by heavy use. Prior knowledge of the quirks of a system will help reduce frustrations.

Finally, electronic message systems can easily become the means for making information overload a reality. Piles of unread printout testify to the problems here. Making it too easy to communicate can lead users to sift through their messages like they do their junk mail--hastily or not at all.

ARE ANY HUMAN SERVICES GROUPS NOW USING ELECTRONIC MESSAGE SYSTEMS?

The following list, while not exhaustive, indicates the diversity of projects now in operation.

- National Network among University Affiliated Programs: A Telecommunications Demonstration

This demonstration, initially supported by HEW, involves the use of a computer-based message system for communication among University Affiliated Program (UAP) task groups.* The project was developed to assist professionals in developmental disabilities in sharing resources and expertise by providing communication links among UAP centers. Although other systems may be utilized in the future, this project has used the OnTyme message systems for exchange of reports and articles, updates on current legislation and funding sources, job placement announcements, and announcements about courses and seminars on various aspects of developmental disabilities. The ongoing support of the system is now shifting over to the participating centers.

- Politechs

Politechs is a system of software within EIES intended to facilitate communication by means of an inquiry/response format. It permits the participant to raise an inquiry or topic and systematically ties all responses to that topic. Politechs is divided into "exchanges," each dealing with a different clientele and/or subject matter. The exchanges in operation so far are:

*A final report of this project, National Networking among UAPs: A Telecommunications Demonstration, Institute for the Future, October 1980, is available upon request.

Publitech--Users raise topics covering a wide spectrum of policy research and management concerns, especially those which relate to the use and understanding of technology.

Legitech--This project is an outgrowth of limited information networking among state legislative researchers. The medium of computerized conferencing is used to support the exchange of scientific and technical inquiries and responses of interest to state legislatures. Special software has been developed to help researchers enter and retrieve only those inquiries and responses of particular interest to them in a brief but comprehensive format.

Rehabtech--Again the use of the inquiry/response format is used to facilitate the exchange of information among individuals and organizations interested in rehabilitation for the disabled. Both consumers and educators use this network.

- Research in Telecommunications for the Deaf (DEAFNET)

SRI International is conducting a project to demonstrate ways in which special portable terminals can be used to overcome some of the communication handicaps of the deaf. In addition to developing the special terminals, the project will design a national network service system for the deaf community.

- Use of HERMES by the Deaf

A research program at Bolt Beranek and Newman, Inc. (Boston, Massachusetts) has supplied communication linkage by computer to an organization of deaf users. Members of this organization use the HERMES system to communicate among themselves, to communicate with the "hearing" world, to obtain news information, and for educational purposes.

- Consultation among Professionals at Institutions

In conjunction with the Center for Developmental Disabilities at the University of Vermont (Burlington), an HEW-funded computer conference was established using the Electronic Information Exchange System (EIES) based at the New Jersey Institute of Technology. In addition to the above institutions, the Brandon Training School, the Waterbury State Hospital in Waterbury, Vermont, the Roosevelt Hospital in New York City, the Shriver Center in Boston, and the Staten Island Center have been linked together

in this conference. This demonstration was focused on information exchange and resource sharing among people who deal with ways of preparing clients to leave institutions. The system was also used for bibliographic exchanges, consultant referrals, discussions of relevant films, and personal support among conference members. This demonstration is now over but may be continued in some form in the future.

HOW DO I EVALUATE WHETHER TO CONTINUE USING AN ELECTRONIC MESSAGE SYSTEM?

An organization testing an EMS should build an evaluation into its trial use. An evaluation doesn't need to be an overwhelming task but, to be most useful, it does need to be incorporated into the initial plan. Fortunately, most electronic message systems can easily track usage patterns. Thus, an experimenting group would know quickly how much the system is being used and by whom. Further, as part of a trial, a new user group might design a simple questionnaire to elicit user reactions. Indeed, the system itself could be used to poll the participants to determine their views on whether the system should be continued. Another factor in evaluating the system is the cost effectiveness.

Evaluation is an important part of introducing any new way of operating. For a small test, an in-house evaluation may be sufficient. For a larger test, the assistance of an outside evaluator may be needed. The more systematic the evaluation the better, but some evaluation is (usually) much better than none.

WHO ARE SOME CURRENT PROVIDERS OF ELECTRONIC
MAIL AND COMPUTER CONFERENCING SYSTEMS?

The following is a list of some currently active systems; no attempt was made
to develop a list of all such systems.*

Electronic Mail Systems

HERMES
Bolt Beranek and Newman
50 Moulton Street
Cambridge, Massachusetts 02138
617-491-1050

INFOPLEX
Plexus Corporation
5000 Arlington Centre Boulevard
Columbus, Ohio 43220
614-457-8600

MAIL; CHAT
The Source
Telecomputing Corporation
1616 Anderson Road
McLean, Virginia 22102
703-356-6790

MAILBOX
Scientific Time Sharing Corporation
7316 Wisconsin Avenue
Bethesda, Maryland 20014
301-657-8220

ONTYME
Tynnet, Incorporated
20665 Valley Green Drive
Cupertino, California 95014
408-446-7032

TELEMAIL
GTE Telenet Communications Corporation
8330 Old Courthouse Road
Vienna, Virginia 22180
703-827-9200

Computer Conferencing Systems

COMET
Computer Corporation of America
575 Technology Square
Cambridge, Massachusetts 02139
617-491-3670

CONFER
Advertel Communication Systems
1030 Fountain
Ann Arbor, Michigan 48103
313-665-2612

ELECTRONIC INFORMATION
EXCHANGE SYSTEMS (EIES)
New Jersey Institute of Technology
323 High Street
Newark, New Jersey 07102
201-645-5321

PLANET
Infomedia Corporation
430 Sherman Avenue
Palo Alto, California 94306
415-321-2682

POLITECHS
Participation Systems, Inc.
43 Myrtle Terrace
Winchester, Massachusetts 01890
617-729-1976

*A more complete, though now dated, description of computer mail systems
is contained in Konrad K. Kalba et al., Electronic Message Systems: The Technological,
Market, and Regulatory Prospects, Kalba Bowen Associates, Inc., Cambridge, Massa-
chusetts, April 1978.

APPENDIX

TELECOMMUNICATIONS AND SERVICE
TO THE DEVELOPMENTALLY DISABLED:
PROJECT BACKGROUND AND PUBLICATIONS

In September 1978, the Alternate Media Center, School of the Arts, New York University, received a two-year grant from the Department of Health and Human Services, formerly Health, Education and Welfare, to explore and demonstrate potential applications of telecommunications in the field of developmental disabilities. This work is being conducted in collaboration with the American Association of University Affiliated Programs, the Department of Pediatric Service at The Roosevelt Hospital in New York City, and the Institute for the Future in Menlo Park.

After an extensive needs assessment, the project team in conjunction with its advisory board decided on a three-pronged approach to demonstrations:

1. In collaboration with the UAF satellite in Burlington, Vermont, and with other Vermont DD organizations, implement a coordinated program of telecommunications applications focusing within that state.
2. Explore the use of telecommunications for national "networking" among UAPs and related centers.
3. Provide technical assistance to a limited number of projects that attempt to make innovative use of telecommunications in the DD field.

Two separate electronic message systems were used to part of this project: EIES (Electronic Information Exchange System at the New Jersey Institute of Technology) and OnTyme (offered by Tynmet Corporation). Reports on each of these demonstrations are available upon request from the Institute, as are earlier studies of group communication through computers.

**TELECOMMUNICATIONS AND SERVICE
TO THE DEVELOPMENTALLY DISABLED**

VOLUME 1: NEEDS AND OPPORTUNITIES

April 20, 1979

Summarizes results from project needs assessment, the rationale for demonstrations, and an appraisal of telecommunications options.

VOLUME 2: APPLICATION POSSIBILITIES

May 15, 1979

Discusses ideas for DD telecommunication applications gathered during needs assessment. Glossary. Bibliography

VOLUME 3: DECISIONS ON DEMONSTRATION PROJECTS

July 2, 1979

Presents decision for implementation phase of project.

**NATIONAL NETWORKING AMONG UAPS:
A PILOT TEST OF ELECTRONIC MAIL**

November 1979

Summarizes results of pilot test of computer-based message system conducted by the American Association of University Affiliated Programs.

A MANUAL FOR UAF ONTYME MESSAGE SYSTEM USERS

November 1979

A specially prepared user's guide for UAP electronic message system users.

**NATIONAL NETWORKING AMONG UAPS:
A TELECOMMUNICATIONS DEMONSTRATION**

January 1980

Outlines plan for UAP national networking demonstration.

**MAKING TELECOMMUNICATIONS WORK FOR THE
DEVELOPMENTALLY DISABLED: A FIRST REPORT
ON THE VERMONT DEMONSTRATIONS**

January 1980

Reviews specific applications under way or planned for Vermont.

**CHOOSING AN ELECTRONIC MESSAGE SYSTEM:
A GUIDE FOR THE HUMAN SERVICES**

September 1980

An introduction to strengths and weaknesses
of electronic message systems.

**ESTABLISHING A TELEPHONE CONFERENCING SYSTEM:
THE DYNAMICS OF DOING IT**

September 1980

Summarizes most important factors in
establishing a telephone conferencing system.

**NATIONAL NETWORKING AMONG UAPS:
A TELECOMMUNICATIONS DEMONSTRATION**

October 1980

Final report of the national
networking demonstration.

Copies of the above papers
may be obtained by writing:

Developmental Disabilities Project
Institute for the Future
2740 Sand Hill Road
Menlo Park, California 94025
415-854-6322

or

Alternate Media Center
School of the Arts
New York University
725 Broadway, 4th Floor
New York, New York 10003
212-598-2852